

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Plant Abstract

Element Code: PDFAB0F2H2

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Astragalus cremnophylax* var. *myriorrhaphis*

COMMON NAME: Cliff milk-vetch; Sentry milk-vetch

SYNONYMS:

FAMILY: Fabaceae

AUTHOR, PLACE OF PUBLICATION: R.C. Barneby. *Dragma Hippomanicum* IV.
Brittonia 31(4): 463, f. 2. 1979.

TYPE LOCALITY: Arizona: Coconino Co., Buckskin Mountain, cliffs south of road
(Honeymoon Trail), 28 km airline distance east of Fredonia; 1890 m; 23 May 1979.

TYPE SPECIMEN: HT: NY. N.H. Holmgren 9145 with P.K. Holmgren and R.C. Barneby,
23 May 1979. IT: BRY, UTC.

TAXONOMIC UNIQUENESS: *Astragalus* is the largest genus of flowering plants in Arizona with over 100 species within the state (Kearney and Peebles 1960); 350 species in North America. The taxon was previously referred to *Astragalus humillimus* (Kearney and Peebles, 1960). *A. cremnophylax* is subdivided into three varieties (*cremnophylax*, *myriorrhaphis*, and *hevronii*), all occurring in narrowly defined habitats, locally endemic, and isolated from each other (Phillips 1992). The three varieties were looked at by Barneby, and determined that the differences between them are not significant; however, based on their being spatially disjunct (no possibility of pollen exchange) he decided to recognize them at the varietal level.

DESCRIPTION: Dwarf, evergreen, perennial, mat forming herb, 2-16 cm (0.8-6.3 in.) diameter, and less than 2.5 cm (1.0 in.) high. Stems short, 1.2 cm long and creeping, with 5-9 compound leaflets. Gray-green leaves produced at the end of the season are 2-3.5 cm (0.8-1.4 in) long, with 7-11 scattered leaflets which disjoint readily when dry, leaving the persistent rachis as a stiff, upright spinescent structure. Raceme of 1-3 tiny flowers is held slightly above the mat; flowers pale purplish-lilac. Fruits are unilocular, obliquely egg-shaped, and hairy; seeds are orange.

AIDS TO IDENTIFICATION: Rachises of old leaves are retained, becoming stiff and upright giving plant a spiny look and feel. Presence of persistent rachis distinguishes this variety from var. *cremnophylax*, var. *hevronii*, and *A. calycosus*. Mature leaves late in growth cycle are 1.5 to 3.5 cm (0.6-1.4 in.) long with 7 to 11 leaflets.

Superficially, may resemble a *Lesquerella* in the same habitat, but *Lesquerella* has simple leaves.

ILLUSTRATIONS: Line drawings of habit, detached leaf, pod and transverse section of pod (Barneby 1979:462)

Color photo of Holotype collection (N.H. Holmgren et al, 1979, NY 5387 in http://scisun.nybg.org:8890/searchdb/owa/wwwcatalogrenz.detail_list)

Line drawing of plant and parts (B. Dennis, in Falk & Jenkins et al, 2001)

TOTAL RANGE: Known from the Buckskin Mountains of northern Arizona, Coconino Co.

RANGE WITHIN ARIZONA: See “Total Range.”

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Prostrate herbaceous perennial, with a dwarf, mat-forming habit.

PHENOLOGY: Flowers late April to May, fruiting May to June.

BIOLOGY: Species unique in habitat preference; existing in only a few limited, highly isolated populations. Seedlings frequently establish in cushions of older or dead plants of the same species. Most seeds do not travel beyond mat of parent plant.

HABITAT: Grows in crevices and depressions with shallow soils (or no soil), on Kaibab Limestone on rim-rock benches, cliff ledges and flat-topped pinnacles at the canyon edge. Typically on points, which extend out from canyon edge escarpment beyond detritus, which slough from talus slopes. May also occur on vertical canyon walls below these points.

ELEVATION: Generally at 6,200 ft (1891 m) elevation, but may be found up to 7,900 ft. (2410 m).

EXPOSURE: Open, with little or no shade.

SUBSTRATE: Exposed ledges of white to gray-white Kaibab limestone (a very specific Kaibab limestone member) with abundant large nodules (inclusions) and fossils (primarily brachiopods).

PLANT COMMUNITY: Great Basin conifer woodland; pinyon-juniper woodland. Surrounding community dominated by pinyon pine (*Pinus edulis*), juniper (*Juniperus* sp.), sagebrush (*Artemisia* sp.), and cliffrose (*Cowania* sp.). Associated plants in the vicinity of the Navajo Tank population include: *Artemisia bigelovii*, *A. frigida*, *Gutierrezia sarothrae*, *Echinocereus triglochidiatus*, *Eriogonum microthecum*, and two superficial cliff milkvetch look-alikes, *Astragalus calycosus* and *Lesquerella arizonica*. Unlike *A. c.* var. *cremnophylax*, *A. c.* var. *myriorrhaphis* is not co-occurring with *Petrophytum caespitosum*.

POPULATION TRENDS: Apparently stable. As of spring 1992, there were approximately 700 individuals *A. c.* var. *myriorrhaphis* known. Falk and Jenkins et al. (2001) reports "Scattered populations at 13 sites of 749 individuals are known."

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[Category 2 USDI, FWS 1993]
[Category 2 USDI, FWS 1990]
[3C USDI, FWS 1985]

OTHER STATUS: Salvage Restricted (ARS, ANPL 1999)
[Salvage Restricted (ARS, ANPL 1993)]
Forest Service Sensitive (USDA, FS Region
3 1990, 1999)
Bureau of Land Management Sensitive
(USDI, BLM AZ 2000, 2005, 2008)

MANAGEMENT FACTORS: An informal trail traverses population at Cape Royal. Very few threats have been identified for Forest Service population. Barring some natural calamity, the plants should continue to thrive within their restricted habitat if left alone. The area is essentially wilderness, inaccessible by vehicle and rarely visited by humans. Fire is not a threat as the shelves with the plants have no fuels. (A.M. Phillips, 1992).

CONSERVATION MEASURES TAKEN: Surveys conducted on Kaibab National Forest, North Kaibab Ranger District 1990-91. Monitoring plots established at Buckskin Mountain population under USFS contract.

SUGGESTED PROJECTS: Continued monitoring of established plots. Additional surveys are needed along outcroppings of the specific Kaibab limestone member, for additional populations.

LAND MANAGEMENT/OWNERSHIP: BLM - Arizona Strip Field Office; NPS – Grand Canyon National Park (Cape Royal on North Rim); USFS - Kaibab National Forest (North Kaibab District); State Land Department.

SOURCES OF FURTHER INFORMATION

REFERENCES:

- Arizona Revised Statutes, Chapter 7. 1993. Arizona Native Plant Law. Appendix A:8.
Arizona Revised Statutes, Chapter 7. 1999. Arizona Native Plant Law. Appendix A.
Barneby, R.C. 1948. *Pugillis astragalorum* IX: Novelties in Batidophaca Rydb. Leaflets of Western Botany. 5(5): 82-85.

- Barneby, R.C. 1964. Atlas of North American *Astragalus*. Part II. Memoirs of the New York Botanical Garden 13: 1005.
- Barneby, R.C. 1979. Dragma Hippomanicum IV. New taxa of *Astragalus* sect. *Humillimi*. Brittonia 31(4): 459-463.
- Falk, M., P. Jenkins, et al; Arizona Rare Plant Committee. 2001 Arizona Rare Plant Guide. Published by a collaboration of agencies and organizations. Pages unnumbered.
- Integrated Taxonomic Information System (ITIS). Retrieved 8/18/2003 from ITIS, <http://www.itis.usda.gov>.
- Kearney, T.H., R.H. Peebles with collaborators. 1951. Arizona flora. Second edition with supplement by J.T. Howell, E. McClintock and collaborators. 1960. University of California Press, Berkeley. p.445.
- Missouri Botanical Garden – TROPICOS, Nomenclatural Data Base. *Astragalus cremnophylax* var. *myriorrhaphis* Barneby. http://mobot.mobot.org/cgi-bin/search_vast. Accessed: 18 Aug 2003.
- NatureServe. 2003. NatureServe Explorer: An online encyclopedia of life [web application]. Version 1.8. Arlington, Virginia. Available: <http://www.natureserve.org/explorer>. (Accessed: August 18, 2003).
- Phillips, A.M. III, B.G. Phillips, N. Brian, L.T. Green III and J. Mazzoni. 1982. Status report: *Astragalus cremnophylax* Barneby. Submitted to U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- Phillips, A.M. III. 1990. Progress report to Kaibab National Forest, Williams, Arizona.
- Phillips, A.M. III. 1992. Distribution and ecology of cliff milk vetch, *Astragalus cremnophylax* var. *myriorrhaphis*, on the Kaibab National Forest. Final report P.O. #43-8156-0-04720, item, 04. Unpublished report for the Kaibab National Forest, Williams, Arizona.
- Rutman, S. 1989. Trip report: memo to files. USFWS, Phoenix, Arizona.
- The New York Botanical Garden. NYBG Specimens Detailed Results. http://scisun.nybg.org:8890/searchdb/owa/wwwcatalog.detail_list. Accessed: 8/18/2003.
- USDA, Forest Service Region 3. 1990. Regional Forester's Sensitive Species List.
- USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.
- USDA, NRCS. 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- USDI, Bureau of Land Management. 2000. Arizona BLM Sensitive Species List. Instruction Memorandum No. AZ-2000-018.
- USDI, Bureau of Land Management. 2005. Arizona BLM Sensitive Species List.
- USDI, Fish and Wildlife Service. 1985. Endangered and Threatened Wildlife and Plants; Review of Plant Taxa for Listing as Endangered or Threatened Species. Notice of Review. Federal Register 50(188):00005.
- USDI, Fish and Wildlife Service. 1990. Endangered and Threatened Wildlife and Plants; Review of Plant Taxa for Listing as Endangered or Threatened Species; Notice of Review. Federal Register 55(35):6190.
- USDI, Fish and Wildlife Service. 1993. Plant Taxa for Listing as Endangered or Threatened Species; Notice of Review. Federal Register 58(188):51151.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

R.C. Barneby - New York Botanical Garden, New York

Ralph Gierisch - St. George, Utah

Art Phillips - private consultant, Flagstaff, Arizona

Sue Rutman - National Park Service, Organ Pipe National Monument, Arizona

ADDITIONAL INFORMATION:

Fall 1991 surveys of the Kaibab National Forest by Art Phillips included searches from Jumpup Point to Willow Point. No plants were found though this appears to be good habitat.

The plants at Cape Royal do not retain the dried leaf rachises. It is possible this is another variety (the fourth) of *Astragalus cremnophylax*.

Revised:	1991-12-05 (JGH)
	1992-05-21 (DBI)
	1992-05-28 (BGP)
	1992-09-14 (BKP)
	2003-09-04 (SMS)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 20XX (= **year of last revision as indicated at end of abstract**). X...X (= **taxon of animal or plant**). Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.